Chapter 16

Industrial Hygiene; Factors

Purpose:

Chapters 15 and 16 supplement DOE 5480.10, CONTRACTOR INDUSTRIAL HYGIENE PROGRAM, of 6-26-85; establishes additional requirements; and provides additional direction for implementation of an Industrial Hygiene (IH) program for the U.S. Department of Energy (DOE), Richland Operations Office (RL) and RL Contractors.

Scope:

In addition to the program requirements of DOE 5480.10, the RL IH Program addresses the following subject areas:

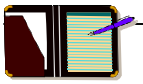
- Use of Respiratory Equipment
- Asbestos Material
- Regulated Carcinogen or Suspect Carcinogenic Materials
- Bloodborne Pathogens
- Cross-Connection Control Standard Hanford Water Systems
- Control of Hazardous Materials
- DOE Filter Test Station, Filter Testing
- Hearing Conservation
- Indoor Air Quality
- Human Factors
- Hazardous Waste Site Safety/Health Management
- References
- Related Chapters
- Attachments

Use of Respiratory Protective Equipment:

1. Policy. RL and RL Contractor employees shall be provided a safe and healthful work environment that assures control and limits the risk of occupational diseases or irritations caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smoke, sprays, and vapors, including radioactive contamination. The primary objective shall be to prevent atmospheric contamination.

   a) Operations or processes shall be conducted in a manner to assure control of all harmful materials and substances.

   b) Respiratory protective equipment shall only be used where effective engineering controls are not feasible, or when judgment and experience indicate there is a potential need for this protective equipment.



c) Existing facilities shall be modified to meet the objectives of this policy when practical and the design of new facilities shall have incorporated appropriate consideration for the objectives of this policy.

d) A decision to use respiratory protective equipment in non-routine operations shall be made by management, based on a thorough review of all factors, and appropriately documented.

2. Responsibilities. RL Contractors shall:

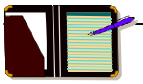
a) Establish and implement programs which will provide a safe and healthful work environment free of air contaminated with harmful concentrations of materials and substances that can cause occupational diseases or irritations. This shall be accomplished, where feasible, by accepted engineering control measures (e.g., containment of the operation or material, ventilation, dilution, and substitution with less toxic material) or modification/alteration of the process.

b) Initiate action for the modification of their facilities, where practical, to eliminate the need for respiratory protective equipment in routine operations. Each contractor shall also ensure that the above policy is reflected in the design of new facilities to the extent practicable.

c) Approve and appropriately document the use of personal protective equipment for control of airborne contaminants in lieu of engineering controls. Where there is a possibility of overexposure or internal deposition of airborne contaminants or significant programmatic impact, the use of appropriate respiratory protection (i.e., full-face respirators) shall be evaluated. (See listed protection factors). Examples of such operations include bagging out radioactive material waste from a glovebox, cutting a radioactively contaminated pipe in a plastic bag, tank farm usage, and working with carcinogens.

d) Utilize the services from Hanford Medical Services Contractor.

e) Respirator program fit testing (see table) and training shall meet the listed requirements:
   (1) Employees who may routinely require the use of a respirator will be fit tested and trained in the initial medical evaluation. Fit testing will be performed anytime it is felt by the employee the respirator does not fit properly.



(2) Prior to entry into any airborne contaminated (elevated levels exceeding established TLVs and Derived Air Concentrations (DAC) atmosphere requiring use of respirators, employees at the location will receive an additional fit evaluation or check and job-specific entry training. Routine respirator users shall conduct a negative or positive pressure test and incidental users shall receive a "puff" type with an acceptable challenge agent prior to use of the respirator.

(3) A medical questionnaire will be filled out by the incidental employee requiring the use of a respirator prior to entry. (See questionnaire)

(4) Positive pressure-demand, tight fitting face piece respirators do require a quantitative fit test or check.

(5) No employee shall wear a tight fitting respirator where a face seal is prevented by facial hair, long hair, skull caps, eye glasses, etc., that project under the face piece sealing surface.

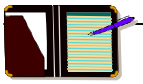
(6) Special respirator fit testing while wearing other prescribed protective clothing being worn may be required.

(7) Contractor supplied respirator mask spectacles (contact lenses will not be provided) may be worn with respirator. RL and Contractor employees may wear personal contact lenses.

3. Minimum Qualification Requirements for Routine Respirator Users

Frequency	Medical Qualification*	Fit Test	Training
Initial	Yes	Quantitative	Core Job Specific
Year 1	Yes	Qualitative	Job Specific
Year 2	Yes	Quantitative	Core

*Users on annual medical examination schedules will be qualified in conjunction with intervening years. For users not on an annual medical schedule, users can be requalified using the questionnaire equivalent.

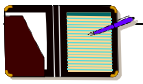


Year 2	Yes	Quantitative	Core
Year 3	Yes	Qualitative	Job Specific
Year 4	Yes	Quantitative	Core
Year 5	Yes	Qualitative	Job Specific

1. Minimum Qualification Requirements for Incidental Users

Frequency	Medical Exam**	Fit Test**	Training
As needed at Time of use	Medical questionnaire	Qualitative	Orientation

**Quantitative test may be requested to determine the best fitting respirator initially. Afterwards only qualitative fit testing will be required prior to entry into an airborne contaminated atmosphere.



MEDICAL QUESTIONNAIRE FOR RESPIRATOR USERS

Name_____Date_____

Social Security No._____Payroll No._____

Employer_____Area Supervisor_____

Have you ever worn a respirator before? Yes_____No ____

If YES, describe any apparent difficulties noted with respirator use if any:

_____

Have you ever been fit tested? Yes_____No _____

If YES, describe type of respirator fit tested and approximate date of test:

_____
_____
_____

Have you had or do you now have any of the following (answer YES* or NO):

1.	Lung disease	1.____
2.	Persistent cough	2.____
3.	Heart trouble	3.____
4.	Shortness of breath	4.____
5.	Sensation of smothering	5.____
6.	Ruptured ear drum	6.____
7.	Other conditions that might interfere with respirator use or result in limited work ability	7.____
8.	Do you have any medical restrictions?	8.____

*Please explain YES answers

_____
_____
_____

*An HEHF physician should be consulted when any question is answered with a YES. Need for a more comprehensive evaluation will be determined by an HEHF physician.

_____
Employee Signature

_____
Reviewer's Signature

Respirator Fit Test Criteria

OSHA Standard	Quantitative Fit Factor Minimum	OSHA Assumed Protection Factor Minimum	# of Fit Tests	# of Exercises	Frequency
Asbestos 1910.1001 & 1926.1101 Construction	Half-100 Full-1000	Half-10 Full-50 Any PAPR-100 Full P.D.-1000	3	9	Annual
Lead 1910.1025	Not Specified	Half-10 Full-50 Any PAPR-1000 Full P.D.-2000	1	6	Annual
Lead 1926.62 Construction	Half-100 Full-500	Half-10 Full-50 Any PAPR-1000 Full P.D.-2000	3	8	Annual
Cadmium 1910.1027 & 1926.1127 Construction	Half-100 Full-500	Half-10 Loose PAPR-25 Full-50 Full PAPR-250 Full P.D.-1000	3	8	Annual
Benzene 1910.1028 & 1926.1128 Construction	Half-100 Full-500	Half-10 Full-50 Full PAPR-1000 Full P.D.-1000	3	8	Annual
Formaldehyde 1910.1048 & 1926.1148 Construction	Half-100 Full-500	Half-10 Full-10/50[3] Full P.D.-100	3	8	Annual
MDA 1910.1050 & 1926.60 Construction	Half-250 Full-1250	Half-10 Full-50 Full P.D.-1000	3	9	Annual
Respiratory Protection 1910.139	Proper selection of respirators shall be made according to the guidance of American National Standard Practices for Respiratory Protection Z88.2-1969. Respiratory Protection Z88.2-1992 is the latest edition.				

[3]The protection factor for a full-facepiece with cartridges is 10. The protection factor for a full-facepiece with a canister is 50.

ANSI Z88.2-1969	Not Specified	Not Specified	Positive & negative pressure fit checks shall be done each time a respirator is donned. Qualitative fit tests should also be required.		
ANSI Z88.2-1980	Half-As measured, to 100 Full-As measured, to 1000 No fit-testing of positive pressure units	Half-As measured, to 100 Full-As measured, to 1000 No fit-testing of positive pressure units	3	6	Annual
ANSI[4] Z88.2-1992	Half-100[5] Full-1000[5]	Half-10[4] Full-100[4] Full PAPR-1000[4] Full P.D.-1000[4]	3[5]	9[5]	Annual

ANSI 1992 Protection Factors

Single Use Dust/Mist (Disposable)	10
Halfmask	10
Fullface	100
PAPR Unit/Halfmask	50
PAPR Unit/Full Face (Tight Fitting)	100/1000 (w/HEPA)
PAPR Unit/Hood or Helmet	1000 (w/HEPA)
PAPR W/Loose Fitting Facepiece	25
Airline, Continuous Flow W/Halfmask	50
Airline, Continuous Flow W/Fullface	1000
Airline, Continuous Flow W/Hood or Helmet	1000
Airline, Continuous Flow W/Loose Fitting Hood	25
Airline, Pressure Demand Halfmask W/O Escape Unit	50
Airline, Pressure Demand Fullface, W/O Escape Unit	1000
Airline, Pressure Demand Fullface, W/Escape Unit	1000
SCBA (Fullface)	*

* For emergency planning purposes, where hazardous concentrations can be estimated, no higher than 10,000.

[4] ANSI Z88.2-1992 Assigned Protection Factors.

[5] Until ANSI Z88.10 is published, the protocol given in OSHA Asbestos Standard, 29 CFR 1910.1001 should be followed.

Asbestos Material:

1. Policy. RL and RL Contractor employees shall be provided a safe and healthful work environment, protected from harmful exposure to asbestos.

2. Responsibilities. RL Contractors shall establish an effective asbestos management and control program which meets the requirements of prescribed Federal and Washington State standards as well as the following specific requirements:

   a) Asbestos-Free Products. Only asbestos-free products shall be used for new or replacement applications unless the proposed use of an asbestos-containing product has been specifically approved by the contractor safety department.

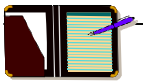
   b) Respiratory Protection. A powered air-purifying respirator (PAPR) shall be the minimum respiratory protection required for all operations involving removal or repair of friable asbestos. Higher levels of protection (i.e., pressure-demand supplied air) shall be utilized when monitoring data or other reliable information are available which establish that a PAPR will provide adequate protection. Respiratory protection for operations involving nonfriable asbestos shall be prescribed by the contractor safety department after review of the operation to be performed.

   c) Asbestos Management Plan. A written asbestos management plan shall be established which provides for identification and periodic inspection of existing asbestos installation and assures proper abatement when necessary. The program shall address the following criteria:
      (1) Use of wet methods and engineering controls, insofar as practicable;

      (2) Avoidance of asbestos material disturbance or damage;

      (3) Use of enclosures and control zones under the direction and/or installation of a certified asbestos supervisor or competent person;

      (4) Use of engineering controls, e.g., ventilation, in combination with wet methods, where practical;



(5) Use of proper protective clothing as designated;
(6) Good industrial hygiene work practices shall be followed by all personnel conducting asbestos work (e.g., showers, limitations on eating, and smoking in the work area, entry/exit practices, etc.);

(7) Medical surveillance shall meet the requirements for removal, spraying and disassembly as in 29 CFR 1910 and 29 CFR 1926; and Washington Administrative Code (WAC) 296-62-07725, and 296-62-07749;

(8) All locations of friable asbestos shall be properly identified and the material contained;

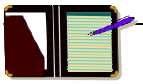
(9) All samples taken for analysis (personnel exposure date) shall have a documented chain-of-custody.

3. Training. RL Contractors shall establish and implement a training program for employees who may be exposed at or above the 0.05 fiber/cc, eight hour TWA action exposure limit of applicable or prescribed standards. Maximum permissible limit shall be 0.1 fibers/cc calculated as an eight hour time weighted average for most asbestos. Special asbestos work training shall be provided as indicated below.

a) Thirty (30) hour asbestos worker certification training shall be provided to site construction crafts, decontamination and decommissioning workers, and immediate supervisors of designated asbestos workers who remove asbestos. This course will be Washington State certified and attendees will be offered an opportunity to receive State certification. This course will be required for employees working in other contractor assigned facilities. Employees requiring certification must carry the card on their person when performing any asbestos work. Refresher training will be provided as in 3.c.

b) Thirty (30) hours asbestos Competent person or Asbestos supervisor training, additional to the asbestos worker (see 3.a) shall be required at all asbestos construction projects. Asbestos supervisor certification shall be in accordance with OSHA 29 CFR 1926.58 and Washington State requirements (WAC 296-65). Person designated shall receive this training and renew as in 3.c.

c) Annual seven (7) hour abbreviated asbestos training based on criteria of the course listed in paragraph 3a and 3b above for



additional training in addition to this course; e.g., radiation worker, respirator, scaffold, etc. This course will be required for employees working in their contractor assigned facilities and can be a refresher course for the 30 hour training.

d) Annual asbestos awareness training (one to two hours) shall be provided to all RL Contractor employees who can be potentially exposed to asbestos fibers that exceed established limits.

e) RL Contractors shall make readily available to all affected employees all written materials relating to employee training, including this procedure.

4. Records. RL Contractors shall establish a records maintenance program which shall include:

a) Proper training, personnel exposure records, and workplace monitoring results.

b) Maintaining records as required in this Order.

c) Notification of employees of exposure results.

Regulated Carcinogen or Suspect Carcinogenic Materials:

1. Policy. RL and RL Contractor employees shall be provided a safe and healthful work environment, protected from harmful exposure to regulated carcinogens or suspect carcinogens. The primary objective shall be to reduce or prohibit the use of regulated carcinogens or suspect carcinogens in the workplace, as defined in this Order. Where this is not practicable, engineering controls shall be used to effectively minimize the exposure through As Low As Reasonably Achievable (ALARA) principles, and the work environment shall be monitored and results documented.

2. Responsibilities. RL Contractors shall:

a) Develop and implement programs which assure the achievement of the objectives of the above policy.

b) Ensure that carcinogenic and suspected carcinogenic materials are properly identified and safely handled as part of the implemented control program.

3. Requirements. RL Contractors shall:

a) Develop and implement procedures which will:
(1) Identify regulated carcinogens or suspect carcinogenic products being used or proposed for use.

(2) Require substitution for carcinogens or suspect carcinogenic products to the extent practicable.

(3) Establish TLV/TWA action levels that require evaluation or control, that are consistent with ALARA principles.

b) Develop and use written procedures for the safe acquisition, handling, use, storage, transportation, and disposal of carcinogens or suspected carcinogenic material.

c) Provide and document appropriate training in hazard recognition and control measures to personnel who transport, receive, store, handle, distribute, use, or dispose of the carcinogen or suspected carcinogenic materials.

d) Inform affected employees of the hazards associated with the use of the regulated carcinogens or suspect carcinogens and advise them of work environment monitoring results.

e) Establish procedures for entry and exit control at regulated areas.

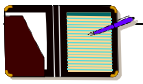
f) Provide appropriate medical surveillance as required by the mandatory requirements for each harmful agent. RL medical services contractor will provide the technical medical review and retain applicable records.

g) Maintain auditable and retrievable records of workplace monitoring, chain-of-custody of samples and personnel exposure data and provide this information to any employee or authorized employee representative within 15 days of receipt of written request. The Medical Services Contractor normally maintains these records as a centralized repository for this information at Hanford.

Bloodborne Pathogens:

This section addresses occupational exposure to Hepatitis B Virus (HBV), Human Immunodeficiency Virus (HIV), and other bloodborne pathogens in the workplace.

1. Policy: RL employees who could come in contact with a person who has a potentially contagious through transmission life-threatening illness



during the course of employment related to emergency or health care support work shall be provided an environment free of recognized hazards as far as practical. The protective means shall be by use of protective measures including equipment and procedures. This requirement meets the requirements of 29 CFR 1960, Subpart C.

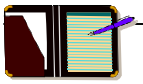
2. References:
   a. U.S. Department of Labor, OSHA Instructions CPL 2-2.44A, Subject - - Enforcement Procedures for Occupational Exposure to Hepatitis B Virus (HBV) and Human Immunodeficiency Virus (HIV), dated August 15, 1988.
   b. Federal Personnel Manual System, FPM Bulletin number 792-42, Subject - - Acquired Immune Deficiency Syndrome (AIDS) in the workplace, dated March 24, 1988.
   c. OSHA 29 CFR 1910.1030, Occupational Exposure To Bloodborne Pathogens.

3. Responsibilities and Authorities
   a. RL shall establish a program to assure employees who provide health care are afforded means to reduce exposure to HBV and HIV. Health care support and emergency workers are generally, but are not limited to employees who are: nurses, physicians, physician's assistants, medical technicians, medical laboratory personnel, paramedics, emergency medical technicians, fire fighters, janitorial workers, laundry workers, and others whose work may involve direct contact with body fluids during routine or emergency services.

   b. Body fluids that have been recognized as linked to the transmission of HIV and/or HBV and to which universal precautions should apply include blood, semen, blood products, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid, amniotic fluid, and concentrated HIV or HBV viruses.

   c. Consistent with this concern for employees the following provisions program shall be provided:

      1) Management:
         a) Assure that employees who are at risk of contracting HBV or HIV contaminated employees are provided acceptable protective equipment and adequate educational support.
         b) Management shall maintain strict confidentiality of employees who could have been exposed, are exposed, or have contracted HBV or HIV.



2) Personnel: Employees shall be provided adequate information as needed as part of the Employees Assistance Program (EAP) including:
   a) Management and employee education and information on terminal illness and specific life-threatening illnesses.
   b) Referral to agencies and organizations which offer supportive services for life-threatening illnesses.
   c) Benefit consultation to assist employee in effectively managing health, leave, and other benefits.

3) Employees: Employees shall follow the guidelines as appropriate in the following section.

4. Guidelines: The following instructions are a guide for dealing with situations involving employees or persons with a potentially contagious through transmission life-threatening illness:
   a. Remember that the health condition of an employee is personal and confidential. Reasonable precautions shall be taken to protect information regarding the employee's health condition.

   b. The HRM shall provide a contact for employees who believe information is needed about terminal illness, or a specific life-threatening illness. The Personnel Department will provide further guidance in managing a situation that involves an employee with a life-threatening illness.

   c. The HRM can be contacted for any concerns about the possible contagious nature of an employee's illness.

   d. The HRM shall make determinations of the need for a statement from the employee's attending physician that continued presence at work will pose no safety or health threat to the employee, co-workers, or customers.

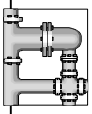
   e. Management shall provide reasonable accommodations for affected employees with a life-threatening illness which shall be consistent with the type of work and needs of the unit.

   f. Management shall be sensitive and responsive to co-workers' concerns and emphasize employee education available through Personnel Departments.

   g. Management shall make no special consideration beyond normal transfer requests for employees who feel threatened by a co-worker's life-threatening illness.

h. Be sensitive to the fact that continued employment for an employee with a life-threatening illness may sometimes be therapeutically important in the remission or recovery process or may help to prolong that employee's life.

i. Encourage employees to seek assistance for medical treatment and consulting services. Information on where or how to do this is to be provided by the Personnel Department and/or EAP.



Cross-Connection Control Standard Hanford Water Systems:

1. Definitions. Terms used within this standard are defined as follows:

   a) Approved. In compliance with specifications and testing requirements as adopted by the Washington State Department of Health (Department), Drinking Water Program.

   b) Air gap. A separation of at least double the supply pipe diameter measured vertically above the vessel flood rim; in no case less than 1 inch.

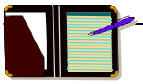
   c) Backflow. The flow of water or other liquids, mixtures, or substances into the distributing pipes of a potable supply of water from any source or sources other than its intended source by backsiphonage or backpressure.

   d) Backflow Preventer. An engineered assembly or means to prevent backflow. Also called a backflow prevention device (device).

   e) Backsiphonage. Backflow resulting from negative pressures in the distributing pipes of a potable water supply.

   f) Cross-Connection. Any physical arrangement whereby a potable water supply is connected (directly or indirectly) with any other water supply system, sewer, drain, conduit, pool, storage reservoir, plumbing fixture, or other device which contains, or may contain, contaminated water, sewage, or other waste, or liquid of unknown or unsafe quality, which may be capable of imparting contamination to the public water supply as a result of backflow.

   g) Double Check Valve Assembly (DCVA). An assembly composed of two single, independently acting check valves,



including tightly closing shutoff valves located at each end of the assembly and suitable connections for testing the watertightness of each check valve.

h) Flood Level Rim. The edge of the receptacle from which water overflows.

i) Flushometer Valve. An assembly which discharges a predetermined quantity of water to fixtures for flushing purposes and is actuated by direct water pressure.

j) Indirect Waste Pipe. A drain pipe used to convey liquid wastes that does not connect directly with the drainage system, but which discharges into the drainage system through an air-break into a vented trap or a properly vented and trapped fixture, receptacle, or interceptor.

k) Potable Water. Water free from impurities present in amounts sufficient to cause disease or harmful physiological effects. Its bacteriological and chemical quality shall conform to the requirements of the Department of Health Drinking Water Standards.

l) Reduced-Pressure Principle Backflow Prevention Assembly (RPBA). An assembly of differential valves and check valves including an automatically opened spillage port to the atmosphere.

m) Vacuum. Any absolute pressure less than that exerted by the atmosphere.

n) Vacuum Breaker. An assembly that permits air entry into a water supply distribution line to prevent backsiphonage.

o) Water Purveyor.The person or entity, with the required level of certification as required by the Department, that has overview of all water distribution and potable water production operations.

2. Responsibilities. RL Contractors shall:

a) Provide a responsible and knowledgeable individual who is a Washington State Department of Health Certified Cross Connection Control Specialist, Water Treatment Plant Operator, and Water Distribution Manager at levels equal to or greater than the system classification to act as Water Purveyor and

perform duties as identified in the WAC Chapters 246-290. This position shall reside in the Site Utilities Division.

(1) The water purveyor or his designated representative shall review and approve all design documents that authorize a configuration change to any water system. Review of other documents shall be at the discretion of the water purveyor as determined necessary to assure compliance with regulatory requirements. The review and approval shall be documented by signature and certification number.

(2) The Water Purveyor shall develop and implement a Cross-Connection Program to include:

(a) Initial cross-connection survey for assigned facilities and take any required corrective action. This survey shall be updated annually.

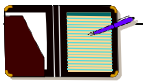
(b) Identification by field audit all installed backflow preventer assemblies and establish a regular preventive maintenance program thereon. Maintain a testing and repair history, which shall include the date installed and the location of each device, and maintain records. Records may be maintained within the owning facility at the water purveyor's discretion.

(c) Proper procurement and storage of spare devices and parts, as required.

(d) Performance of acceptance testing of all newly installed backflow preventer assemblies. Tests shall be performed on back flow prevention assemblies upon completion of any maintenance and annually as a minimum. Testing records shall be maintained as prescribed by the water purveyor.

(e) Bacteriological testing, from representative locations as directed by the Department of Health, to insure potability within domestic (potable) water systems.

(f) Compliance with the requirements of this standard, the Washington Administrative Code, and most recently published edition of the manual titled, Accepted Procedures and Practices in Cross Connection - Pacific Northwest Section - American Waterworks Association. Interpretation of the regulatory requirements and implementation guidelines shall be provided by the water



purveyor. Exceptions to this order may be granted by the DOE-RL Assistant Manager for Safety, Environment and Security (AMS) as requested by the water purveyor.

(g) The maintenance of records of all persons certified to test backflow prevention assembly.

b) All site contractors shall comply with all elements of the cross-connection control program as established by the water purveyor.

3. Requirements.

a) General. A potable water supply system shall be designed, installed, and maintained in such manner as to prevent contamination from non-potable liquids, solids, or gases being introduced into the potable water supply through cross-connections or any other piping connections to the system.

b) Cross-Connection Prohibited. Cross-connections between potable water systems and other systems or equipment containing water or other substances of unknown or questionable safety, are prohibited except when and where suitable protective assemblies are installed, tested, and maintained to ensure proper operation on a continuing basis. Double check valves are acceptable in low hazard conditions only.

c) Individual Water Supplies. Cross-connections between an individual water supply and a potable public supply shall not be made unless specifically approved by the contractor review and approval authority.

d) Connections to Boilers. Potable water connections to boilers shall be made through an approved air gap or provided with an approved backflow preventer assembly.

e) Prohibited Connections to Fixtures and Equipment. Connection to the potable water supply system for the following is prohibited unless protected against backflow.
(1) Pumps for nonpotable water, chemicals, or other substances: priming connections may be made only through an air gap.

(2) Building drainage, sewer, or vent systems.

(3) Any other fixture of similar hazard.

f) Heat Exchanges. The type of backflow protection required will depend on the combination of transfer medium and heat exchanger used. If backflow protection is required, the backflow preventer shall be installed on the potable water supply line to the heat exchanger, on the service line to the facility, or both. The type of device will be determined based on the degree of hazard as designated by the Water Purveyor.

g) Protection Against Backflow and Backsiphonage.

(1) Water Outlets. A potable water system shall be protected against backflow and backsiphonage by providing and maintaining at each outlet:

(a) Air gap between the potable water outlet and the flood level rim of the fixture it supplies, or between the outlet and other source of contamination; or

(b) An assembly or means to prevent backflow.

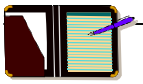
(2) Minimum Required Air gap.

(a) How measured. The minimum required air gap shall be measured vertically from the lowest point of a potable water outlet to the flood rim or line of the fixture or receptacle into which it discharges.

(b) Size. The minimum required air gap shall be twice the size of the effective opening of a potable water outlet, but never less than one inch. If outlet is a distance less than three times the size of the effective opening away from a wall or similar vertical surface the minimum required air gap shall be three times the size of the effective opening of the outlet.

h) Prevention Assemblies. It is vital that the degree of protection provided be commensurate with the degree of hazard present. In instances where health or other unknown hazards exist, the air gap separation, when properly maintained, offers the highest known degree of reliability. The RPBA offers the highest mechanical protection. A description of mechanical assemblies follows:

(1) Reduced-Pressure Principle Backflow Prevention Assembly (RPBA).



(a) The RPBA consists of two independently acting, spring loaded check valves separated by a spring loaded differential pressure relief valve. This assembly shall be installed with two resilient seated full flow shutoff valves and test cocks. The differential pressure relief valve will maintain a differential of not less than 3 psi between the supply pressure and the zone between the two check valves by discharging to the atmosphere. The RPBA is normally used in locations where an approved air gap is impractical. This assembly is effective against backflow caused by backpressure and backsiphonage, and is used to protect the water system from substances which are hazardous to health.

(b) Installation of RPBA shall be per the most recent addition of the American Water Works Association (AWWA) guidelines.

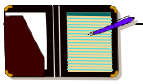
(2) Double Check Valve Assemblies (DCVA).

(a) This assembly consists of two internally-loaded approved check valves, either spring-loaded or internally weighted, installed as a unit with two resilient seated full flow shutoff valves and test cocks. This assembly is effective against backflow caused by backpressure and backsiphonage and is used to protect the water system from substances which are not hazardous to health.

(b) Installation of DCVA shall be per the most recent addition of the AWWA guidelines.

(3) Vacuum Breakers. Vacuum breakers, either pressure or atmospheric, are effective against backsiphonage only and cannot be used in an area where a positive pressure can be developed on the downstream side of the assembly, or in an area where the vacuum breakers are subject to flooding. Vacuum breakers are not acceptable backflow protection at premises service connections other than lawn sprinkler systems. When vacuum breakers are installed in a line which will reach a temperature of 160 degrees Fahrenheit or above, a hot water type vacuum breaker must be used.

(a) Pressure Vacuum Breaker (PVB) with Internal Check Valve.



- Pressure vacuum breaker assemblies consist of a check valve (sometimes two), vacuum relief, inlet and discharge shutoff valves, and test cocks.

- This assembly shall be installed per the most recent addition of the AWWA guidelines.

(b) Atmospheric Vacuum Breaker.

- An atmospheric vacuum breaker is an assembly which allows air to enter the water line when the line pressure is reduced to a gauge pressure of zero or below, in psi gauge. The atmospheric vacuum breaker is designed to prevent backsiphonage only.

- It is not effective against backflow due to the backpressure and shall not be installed where it will be under continuous operating pressure for more than 12 hours in any 24-hour period.

- This assembly shall be installed per the most recent addition of the AWWA guidelines.

i) Miscellaneous.

(4) Where water for purposes such as flushing drains, filling tankers, etc., is drawn from a fire hydrant connected to a potable water system, a backflow prevention assembly or air gap will be required to protect the system from backflow through the system.

(5) Where water systems are used as a grounding media, stray currents can induce a current in water pipe. If a backflow assembly should be removed for repair, an electrical shock could result. It is mandatory that ground wires be installed around backflow assemblies to remove the shock hazard in systems that use the piping as a ground.

(6) Fire sprinkler systems, shall have properly installed backflow prevention device installed as required by the Water Purveyor. RPBA or DCDA shall be installed according to the degree of hazard as applicable.

j) Testing and Maintenance.

(1) Each RPBA, DCVA, and PVB shall be tested as a minimum annually in accordance with approved testing procedures approved by the Water Purveyor.

(2) Testers shall be responsible for making competent tests an inspections, for repairing or overhauling backflow prevention assemblies, and for making reports of such repair (including the list of materials or replacement parts used).

(3) Assemblies shall not require opening for overhaul and internal inspection (for wear and malfunction) unless failure of the annual performance test as listed in 3j(l), and is not replaced.

(4) Nonpressure vacuum breakers shall be subject to an annual inspection to determine that the assemblies are functioning normally.

(5) Assure that parts as supplied by the manufacturer are used during repair of assemblies, and that no changes to the design, material or operational characteristics of an assembly are made without prior approval.

k) Training of Testers. Only Washington State Department of Health certified backflow assembly testers shall inspect and test all backflow prevention assemblies.

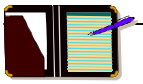
l) Approval of Assemblies. Only those devices that are on the most recently published list of approved devices provided by the Washington State Department of Health shall be approved for installation on the Hanford Site.

m) Disinfection. The disinfection of backflow prevention assemblies, piping, fittings, and accessories shall be accomplished before or during installation, as specified by applicable American Water Works Association standards as approved by the Water Purveyor.

n) Water Main Installation. Water mains shall be installed as required by the latest edition of the 10 State Standard, AWWA, and Criteria for Sewage works design. The applicable criteria shall be used for parallel installation, crossings, and separations both vertical and horizontal.

Control of Hazardous Material and Physical Agents:

1. Policy. RL and RL Contractor employees shall be provided a safe and healthful working environment which ensures that exposure to hazardous materials does not exceed RL standards and is



maintained on a reduction/minimization of exposure level consistent with work requirements.

2. Responsibility. RL Contractors shall define a hazardous material in accordance with the definition provided on page 2, paragraph 5a, of this Order. RL Contractors shall conduct their operations in a manner which is consistent with DOE O 440.1 by providing for responsible management of hazardous materials. RL Contractors shall:

   a) Develop a formalized written Hazard Communications Program in conformance with OSHA 29 CFR 1910.1200, "Hazard Communication."

   b) Implement procedures to identify hazardous materials that are being used or proposed for use, and require the substitution of non-hazardous materials and engineering controls to the extent practical using good industrial hygiene work practices.

   c) Implement procedures for the safe acquisition, handling, use, storage, transportation, disposal and spill control preparation of hazardous materials to the extent practicable. Action levels (normally 50 percent of the TLV/TWA) shall be established for hazardous materials and physical agents that require evaluation and the results properly documented.

   d) Strong consideration must be given to acute and chronic exposure potential. (Note: Chronic exposure potentials are frequently overlooked, because they are not obvious).

   e) Provide and document appropriate awareness training, including job specific for personnel who transport, store, handle, use, or prepare for disposal of hazardous materials and control of any spills.

   f) Inform employees of the hazards associated with the use of the identified hazardous materials and advise them of work environment monitoring results and when the DOE prescribed standards as in DOE 5480.4 and DOE O 440.1 are exceeded.

   g) Maintain records of workplace monitoring, chain-of-custody on all samples and personnel exposure data for classified hazardous materials in a manner that is auditable and retrievable. Provide this information within 15 days upon written request from an employee or authorized employee representative. The medical

services contractor normally maintains these records at a centralized repository for this information at Hanford.

DOE Filter Test Stations and Filter Testing:

1. Policy. All HEPA filter units, cartridge filters and air movers/vacuums that are used for health or environmental protection purposes will be leak or efficiency tested, quality inspected, and approved at a DOE Filter Test Station at Oak Ridge National Laboratory before acceptance by the contractor from the supplier.

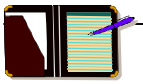
2. Responsibilities. RL Contractors should establish a program to assure that the HEPA filter units and cartridge filters and air movers/vacuums used for toxic (fumes, mists, aerosols, particulates) materials, i.e., radiological, asbestos, chromium, etc., will not be accepted from the supplier for installation and use in Hanford facilities until the units are tested, inspected, and approved by a DOE Filter Test Station for conformance to the applicable standards, procurement specification(s) and DOE-RL requirements.

   a) RL Contractors shall:

      (1) Develop procurement specifications for, (a) HEPA filters which are in accordance with the requirements of Nuclear Air Cleaning Handbook, ERDA 76-21 and (b) special portable HEPA filtered air movers, i.e., vacuum cleaners, negative air machines, etc., and (c) replacement HEPA filters for air movers and vacuum cleaners.

      (2) Develop and implement acquisition, purchasing and acceptance procedures which will reduce handling and yet assure safe handling, storage, transportation, and use of filters.

      (3) Assure that all requisitions for vacuum cleaners, negative air machines and replacement HEPA filters which may be used in toxic work environments, whether nuclear or non-nuclear meet specifications, and requisitions for new units shall be routed to Contractors Safety Departments for review and approval prior to procurement. Once approved, a list should be established for future reference. This review and approval shall include the determination that units and filters where applicable meet established criteria, i.e., proper intended use, UL 586, proper labeling, ANSI N509



and 510 requirements, acceptable flow rate/differential pressure, IES-RP-001-86, etc.

(4) Assure filters and special air movers will not be accepted until they have been tested, inspected, and approved by the DOE Filter Test Station.

(5) Assure that the supplier provides replacement filters until the stipulated quantity of filters has been approved.

(6) Contact the supplier to obtain instructions concerning the disposition of unacceptable filters. If no response is received from the supplier or operating contractor within 30 days after notification, the filters shall be disposed of at the Filter Test Station's discretion. No expense shall be incurred without the prior concurrence of the contractor.

(7) Assure filters (HEPA and charcoal) are properly designed for the system, properly installed in the facility or air mover, and are in-place leak tested annually using an approved challenge aerosol to meet DOE-RL requirements.

(8) Conduct efficiency tests on HEPA and charcoal units as required in ANSI N509 and N510.

b) <u>The Air Balance Filter Test Groups shall:</u>

(1) For air movers/vacuum cleaners with HEPA filters:
(a) Test the entire unit (filters installed) to the specifications for efficiency or leak testing as specified by the contractor.

(b) Reject HEPA filter or entire unit which does not meet the contractor's specifications as applied.

(c) Notify the contractor if purchased product(s) do not meet the supplied specifications or requirements.

(d) Tag the HEPA filter or unit with the indicated acceptable test results.

(e) Return unacceptable HEPA filter(s) or unit(s) to the contractor for their disposition and resolution of the problem with the supplier.

(f) Subsequent (periodic, annual, or whenever filters are disturbed) in-place testing of air movers/vacuum cleaners shall be performed by contractor personnel as required.

(g) Maintain inspection and test results for each unit/filter.

Hearing Conservation:

1. Policy. RL and RL Contractor employees shall be provided with a safe and healthful working environment which ensures that exposure to harmful noise does not exceed standards, is maintained at ALARA level consistent with work requirements.

2. Responsibility. RL Contractors shall establish a hearing conservation program that identifies, evaluates, and controls noise exposure to employees and ensures that a safe and healthful work environment is provided. RL Contractors shall:

   a) Conduct their operations in a manner which provides for responsible management of a noise and hearing conservation program, and is consistent with:
      (1) Occupational Safety and Health Act - 1970, 29 CFR 1910.95; and

      (2) American Conference of Governmental Industrial Hygienists, Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment for TLVs and action levels only.

   b) Control noise exceeding RL requirements by engineering methods where feasible. The use of protective equipment is permitted, provided a hearing protection attenuation program for the noise environment has been conducted and evaluated.

   c) Assure that good work practices and controls are employed. These shall include:
      (1) Identification of noise sources and affected employees;

      (2) An annual training program for identified employees;

      (3) Periodic Audiometric testing (baseline, and at least annually for identified employees);

      (4) Monitoring of work environment and affected employees; and

(5) Maintenance of adequate records that are accessible to employees.

d) Provide appropriate medical surveillance as required. RL Medical Service Contractor will provide the technical medical review.

e) Maintain auditable and retrievable records of workplace monitoring, chain-of-custody on samples taken and personnel exposure data and provide this information to any employee or authorized employee representative within 15 days of receipt of written request. Medical Services Contractor normally maintains these records as a centralized repository for this information at Hanford, and retains applicable records.

Indoor Air Quality:

1. Policy. RL and RL Contractors employees shall be provided a level of acceptable indoor air quality, which will cause no undue irritation, acute or chronic health effects.

2. Responsibilities. RL and RL Contractor management shall establish a safe, healthful work environment which controls indoor air quality to acceptable levels. This shall include:
   a) Development and implementation of programs which will assure achievement of the objectives of the above policy.

   b) Ensure that ambient air quality and ventilation guidelines are properly identified as part of the implemented control program.

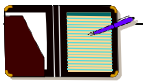
3. References.

   a) Threshold Limit Values and Biological Exposure Indices for (most current year) American-Conference of Governmental Industrial Hygienists (ACGIH).

   b) American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) 62 (most current year), Ventilation for Acceptable Indoor Air Quality, ASHRAE standard.

   c) ACGIH Industrial Ventilation Manual (most current edition).

   d) Federal Regulation, Title 41, Part 101-20, "Smoking Regulations."



e) DOE Order 3792.2, Smoking Regulations, of 4-8-87.

f) DOE Order 5480.4, Environmental Protection, Safety, And Health Protection Standards, of 5-15-84.

g) RL Order 5480.4B, Environmental Protection, Safety, And Health Protection Standards, of 10-4-89.

4. Requirements. RL and RL Contractors management shall:

a) Develop and implement procedures which will:

(1) Respond to employee concerns about indoor air quality and identify indoor air contaminants including: products of tobacco smoke; carbon monoxide; lead; nitrogen dioxide; oxidants (ozone); particulates; and sulfur dioxide.

(2) Assure appropriate efforts to mitigate or eliminate sources of indoor air pollutants.

(3) Require adequate ventilation within the facility where indoor air quality does not comply with standards.

(4) Require adequate design, and maintenance of heating, ventilation and air conditioning systems controls, to reduce harmful bacteria and viruses in the intake air handling system(s). Consideration shall be given to bacteria, fungal, pollen irritants and formaldehyde containing products.

(5) Establish a smoke-free work environment as applicable.

b) Provide and document appropriate monitoring of the indoor ambient air where complaints of excessive illnesses are reported that could reasonably be related to indoor air quality.

c) Inform employees of any identified hazards in the air and the levels measured within the work environment.

d) Provide appropriate medical surveillance as required by DOE 5480.4A mandatory requirement for specific harmful contaminant.

e) Maintain auditable and retrievable records of work place and personal exposure data. Provide this information as required in DOE O 440.1.

Human Factors Program:

1. Policy. A Human Factors Ergonomics Program will be established by RL Contractors to provide guidance and direction for the human-machine interface to comply with Department of Energy requirements during the design, operation and maintenance of the work place to reduce the probability of human error and repetitive motion injury and illnesses.

2. Responsibilities. RL and RL management shall establish Human Factors Program that will cover; systems development, work place design, operations, maintenance and procedures required for new facilities, existing facilities, and the services required to support the facilities.

3. Reference: DOE Order 6430.1A, General Design Criteria, of 4-6-89, Human Factors Engineering.

4. Requirements. RL and RL Contractors shall implement the following requirements as applicable:

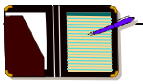
   a) A human factors engineering program plan will be prepared in the initial phase of system development.

   b) The needs and requirements of user/operator system shall be systematically examined and documented for systems that present QA Level I risk to the public, a facility, or facility personnel.

   c) Human factors criteria and other appropriate design criteria will be identified to assist in the design and selection of equipment to be operated and maintained on the Hanford site.

   d) The Human Factors Program shall verify, during testing and evaluation, that the system can be operated and maintained by user personnel under the conditions for which it was designed, including off-normal events.

   e) System design considerations shall include the following generic topics:
      (1) Human Dimensions.
      (2) Human Capability/Stresses.
      (3) Environmental Concerns.
      (4) Component Arrangement.
      (5) Protective Equipment.
      (6) Display Systems.



(7) Control Systems.
(8) Warning and Annunciation Systems.
(9) Communication Systems.
(10) Maintainability.
(11) Labeling/Signs.
(12) Temperature/Pressure.
(13) Vibration.
(14) Noise.
(15) Light.

Note: Bodily discomfort experienced while enduring work station activities may be a signal of improper ergonomic conditions.

5. Implementation.

a) The Human Factors Program will normally be facilitated by Industrial Engineering. Human factors specialists will be assigned areas of responsibility where they will serve as representatives for their assigned areas. The representatives will prepare a human factors engineering plan specifying the type of human factors analyses and evaluations required, level of effort, tasks to be performed, and scheduling milestones as part of the system development process.

b) Representatives will be members of the design teams for projects in their assigned areas of responsibilities. The Representatives' involvement in the design effort will be defined in the program plan. The amount of involvement shall be appropriate to the level of importance of the system and the level of risk associated with the system.

c) The representative will conduct training/orientation classes in the application of human factors principles and criteria. The classes should be structured to support the type of work performed by those attending the class. The classes will be updated periodically, to assure the advances in technology are incorporated in the design process and work place analysis.

6. Funding.

a) Funding for human factors support will be provided by the program or department or the department requiring the service. The representative should have advanced notice of the service need date to assure the resources will be available when required. Where possible, funding should be identified as part of the annual budgeting process.

b) The Human Factors Program shall apply to any new or major modifications to facilities or projects. Normally retrofitting to these specifications will not be required, unless to comply with occupational health and safety requirements.

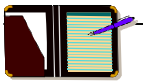
Hazardous Waste Site Safety/Health Management:

1. Policy. The RL Contractor designated as responsible for Hazardous Waste Site Safety shall assure that procedures are in place to maintain control of all work on hazardous waste sites to include preliminary site assessment, characterization and remediation activities as established by the Site Safety Officer.

2. Responsibility and Authorities.

   a) Contractor Management. The Hazardous Waste Site Management Contractor (HWSMC) is the RL Contractor who has been assigned onsite responsibility for the investigatory work on a specific hazardous waste site. However, the HWSMC may fund work to be accomplished by other site contractors for which site management is included within their (the funded contractor's) scope of work. In such instances, the funded contractor will assume the primary site management and safety responsibilities associated with this DOE Order and the funding contractor will be expected to understand and comply with the funded contractor's site requirements. As stated, the funded contractor (in certain instances) becomes the HWSMC. RL Contractor and subcontractor(s) shall have an approved Health and Safety Program.

   b) Site Management Responsibility. Whenever a DOE-RL HWSMC assumes or is given site management responsibility, all work activities will be subject to site management and safety requirements established by the HWSMC. The HWSMC shall have authority to stop work when work is not being performed in accordance with the approval program/plan(s). It is expected that all site workers inside the exclusion zone (including necessary personnel from other DOE-RL Contractors and essential visitors and vendors) will:
      (1) Be fully trained and qualified as hazardous waste workers as required by Occupational Safety and Health Standard, 29 CFR 1910.120 and paragraph 3f of this Order;



(2) Have read and understood the site Health and Safety Plan (HASP); Pre-Job Safety Plans (PJSP); or Job Safety Analysis (JSA); or Site Specific Safety Plans;

(3) Attend required pre-job safety meetings and tailgate meetings as directed by the HWSMC;

(4) Conduct themselves in accordance with site operational safety management directives (written and oral); and

(5) Report to the site with safe equipment and approved procedures to operate safely.

c) Site Safety Officer (SO). The competent individual assigned at the hazardous waste site who reports to the Contractor Management and has the responsibility and authority to assure implementation of the Site Health and Safety Program or Plan and verify compliance with applicable requirements.

3. Requirements.

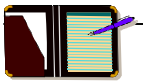
a) A written Site Health and Safety Plan shall be approved by management and properly implemented.

b) The HWSMC shall restrict the number of onsite personnel within the exclusion zone to those employees who are actually needed to support the work effort.

c) The HWSMC will also ensure that ALARA principles for radiological and non-radiological hazardous materials are applied in the preparation of all health and safety plans, and all such ALARA criteria is followed during the course of the work.

d) Once the HWSMC relinquishes site management responsibilities to another HWSMC, the previous contractor has the responsibility to inform the new contractor of all known and suspected risks associated with the site. All pertinent data generated at the site shall be transmitted to the new contractor.

e) To achieve compliance with the training for entry mandates established in DOE 5480.4, and OSHA, 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response," the listed requirements shall be complied with, as applicable. The affected operations or sites at Hanford generally include: Tank Farms, Cribs, Grout, Site Characterization, Chemical and Shock



Sensitive Disposal, Waste Storage, Ground Water Monitoring, or other state or Federal Designated sites.

f) The training requirements consistent with 29 CFR 1910.120 for entry into the identified sites are set forth below:
   (1) 24 Hour Training, plus 1 day (8 hour) individual site briefing: Support personnel or workers and personnel requiring occasional entries; e.g., inspectors, program managers, who require escorted or unescorted entry into the exclusion zone.

   (2) 40 Hour Training, plus 3 (24 hour) day individual site briefing: For workers who are subject to direct handling or involvement in the operation, or are required to wear respirators.

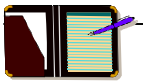
   (3) 8 Hour Additional Training: For supervisors who overview work activity or direct workers who are handling materials or involved in the operation.

   (4) 8 Hour Refresher Training: All personnel, workers, and supervisors who have taken the 24 and 40 hour required training. This training is required annually to maintain entry requirements.
      (a) Once completed this training will be accepted at other DOE Hazardous Waste Sites nationwide. The various site specific individual briefings will be required. Recognized and approved training from other locations will be honored at Hanford.

      (b) Furthermore, personnel identified for entry into Hazardous Waste Sites where the 24 or 40 hour training is required will receive the mandatory respirator and medical surveillance as provided by the Occupational Medical and Environmental Health Services Contractor.

   (5) 16 Hour Additional Training: Workers and Supervisors may request or need 16 hours of practical application to upgrade from a 24 hour to a 40 hour worker. (Note: This does not "reset" the annual refresher training due date.)

g) The HWSMC is required to provide each site employee with a formal Pre-Job Safety meeting outlining the requirements of the PJSP (established procedures and precautions) prior to his/her singular entry into the exclusion zone. This briefing will, as a minimum, provide a clear explanation of the following:



(1) The known and suspected physical, chemical and biological risks associated with the site;

(2) The protective systems and requirements which are in place to mitigate such hazards;

(3) Identification of and establishment of strict procedure for any potential or actual confined space;

(4) The environmental monitoring and sampling work process and the associated warning and action levels/responses which will be taken by all personnel;

(5) Emergency response procedures; and

(6) Decontamination procedures.

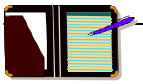
h) All entries into hazardous waste sites shall be by use of a "buddy system."

4. Guidelines.

a) In order that clear and concise site management authority and responsibility be maintained on each hazardous waste site, only one contractor will be the HWSMC at a time, and all other individuals representing other contractors, subcontractors, vendors, visitors etc., will comply with the onsite safety and health requirements issued by the HWSMC.

b) Work involving the characterization and remediation of hazardous waste sites can present multiple, sudden and/or unanticipated risks; management of all such work must be clearly defined in every phase of the job. This Order is written to provide direction to DOE-RL Contractors (with the appropriate specifics) in planning, organizing, and conducting hazardous waste site work. Specifically, this Order provides direction for providing a safe environment for hazardous waste site workers.

c) DOE-RL requires that all work (including preliminary investigation activities) be conducted in such a manner that it conforms to applicable federal and state safety and health standards and that all operating equipment meets all safety and operability standards and requirements. Work on a hazardous waste site can include high risk occupational hazards such as those associated with drilling, hoisting and rigging, and



excavating. These industrial risks can be compounded when they are located in environments where unanticipated exposures to chemical vapors, gases, particulates and radionuclides may occur. Presence of changing conditions associated with the hazardous waste operations, the need for informed, onsite decisions by management must be made promptly in order to adequately protect all workers.

d) HWSMC shall make preliminary notification to DOE-RL Safety and Environment Division and Divisions having program responsibility as soon as an unusual event becomes known. This event may include suspected or actual concerns; e.g., spill, accident, exposure. In no case shall the notification exceed 4 hours.

References:

- 29 CFR 1910.95, OSHA, 1970
- 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response
- 29 CFR 1910.1200, Hazard Communication
- 29 CFR 1926
- 29 CFR 1926.58, OSHA
- American Conference of Governmental Industrial Hygienists (ACGIH)
- American Water Works Association (AWWA)
- ANSI N509
- ANSI N510
- DOE 5480.4, Environmental Protection Safety, and Health Protection Standards, 5/15/84
- DOE O 440.1, "Worker Protection Management DOE Federal and Contractor Employees."
- DOE 6430.1A, General Design Criteria
- DOE Order 3792.2, Smoking Regulations, 4/8/87
- IES-RP-001-86
- Washington Administrative Code, (WAC) Chapters 246-290
- Also See Reference Section In Chapter 15.

Related Chapters:

- Chapter 1, “Organization and Program for Operational Safety; General.”
- Chapter 2, “Codes and Standards.”
- Chapter 3, “OSHA”
- Chapter 5, “Construction and Demolition.”
- Chapter 15, “Industrial Hygiene; General”
- Chapter 17, “Safety Inspection Checklist.”

Attachments:

- Attachment 1: *Industrial Hygiene Records*

Attachment 1:

Industrial Hygiene Records

Please insert a copy of applicable training records following this page or indicate the location of these records on the form below.

Facility Name:		
Training Records Location:	**Initial:**	**Date:**